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CLAIMS

(57) [Claim(s)]

[Claim 1] The magnet switch for starters characterized by providing the following. (a) The plunger which is arranged on the same axial center as the pinion gear to which rotation of a starter motor is told, and extrudes the aforementioned pinion gear to the starter-ring side of an internal combustion engine. (b) The magnetic coil wound around the periphery of this plunger. (c) Coil housing which has the barrel wall section which is extended by shaft orientations from the stop section which stops the end section of this magnetic coil, and the periphery edge of this stop section, and is inserted in the periphery of the aforementioned magnetic coil. (d) The tubed starter case which fixes the aforementioned coil housing by having the grand plate fixed to the aforementioned barrel wall section, and two or more protruding line sections which project towards the outside of the direction of a path in (e) inner circumference, and pressing the aforementioned barrel wall section fit in the inner circle wall of two or more aforementioned protruding line sections while countering the aforementioned stop section, being arranged and stopping the other end of the aforementioned magnetic coil.

[Claim 2] The magnet switch for starters characterized by providing the following. (a) The plunger which is arranged on the same axial center as the pinion gear to which rotation of a starter motor is told, and extrudes the aforementioned pinion gear to the starter-ring side of an internal combustion engine. (b) The magnetic coil wound around the periphery of this plunger. (c) Coil housing which has two or more protruding line sections which are extended by shaft orientations from the stop section which stops the end section of this magnetic coil, and the periphery edge of this stop section, and have the barrel wall section inserted in the periphery of the aforementioned magnetic coil, and project towards the outside of the direction of a path on the periphery of this barrel wall section. (d) The tubed starter case which fixes the aforementioned coil housing the grand plate fixed to the aforementioned barrel wall section, and by pressing two or more aforementioned protruding line sections fit in the (e) inner circle wall while countering the aforementioned stop section, being arranged and stopping the other end of the aforementioned magnetic coil.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the magnet switch for starters which performs the work which extrudes a pinion gear to the starter-ring side of an internal combustion engine, and the work which open and close the contact established between the power supply and the starter motor.

[0002]

[Description of the Prior Art] The starter by which the pinion gear to which rotation of a starter motor is told, and the plunger which extrudes this pinion gear to the starter-ring side of an internal combustion engine are conventionally arranged on the same axial center in the reference number 23-015 (date-of-issue July 20, 1981) of the Nippondenso public presentation technical report is indicated. And a plunger moves to the starter-ring side of an internal combustion engine by the magnetomotive force produced when current flows to the magnetic coil wound around the bobbin inserted in the periphery of this plunger.

[0003] In addition, between the grand plate with which movement of the direction of a pinion gear is first regulated in contact with the pin center, large case of a starter, and the stop section of coil housing, the fixed method to the starter of a magnetic coil is in the state which put the magnetic coil, and inserts in a magnetic coil at the inner circumference of the barrel wall section of coil housing. And pressing a magnetic coil to a grand plate side by the stop section of coil housing, the lobe formed in the pinion gear side of the barrel wall section is inserted in the notch of a grand plate, the point of the lobe is taken out to the pinion gear side of a grand plate, the point of the lobe is fixed to a pin center, large case by the caulking, and a magnetic coil is fixed to a pin center, large case.

[0004]

[Problem(s) to be Solved by the Invention] however, in the conventional technology, since the method of fixing a lobe to a pin center, large case by the caulking was used pressing a magnetic coil to a grand plate side by the stop section of coil housing, work was difficult, and since the method side of the outside of the direction of a path of coil housing moreover was not regulated, there was possibility that coil housing would deform into the method of the outside of the direction of a path, and it would become imperfect fixing [of a magnetic coil] it this invention aims at offer of the magnet switch for starters which attachment by coil housing and the starter case is simplified, and can certainly fix a magnetic coil.

[0005]

[Means for Solving the Problem] The plunger which is arranged on the axial center as the pinion gear to which rotation of a starter motor is told with the same invention according to claim 1, and extrudes the aforementioned pinion gear to the starter-ring side of an internal combustion engine, The stop section which stops the end section of the magnetic coil wound around the periphery of this plunger, and this magnetic coil, And while being extended by shaft orientations from the periphery edge of this stop section, countering coil housing which has the barrel wall section inserted in the periphery of the aforementioned magnetic coil, and the aforementioned stop section, being arranged and stopping the other end of the aforementioned magnetic coil It has the grand plate fixed to the aforementioned barrel wall section, and two or more protruding line sections which project towards the outside of the direction of a path in inner circumference, and the technical means equipped with the tubed starter case which fixes the aforementioned coil housing was adopted by pressing the aforementioned barrel wall section fit in the inner circle wall of two or more aforementioned protruding line sections. The plunger which is arranged on the axial center as the pinion gear to which rotation of a starter motor is told with the same invention according to claim 2, and extrudes the aforementioned pinion gear to the starter-ring side of an internal combustion engine, The stop section which stops the end section of the magnetic coil wound around the periphery of this plunger, and this magnetic coil, And coil housing which has two or more protruding line sections which are extended by shaft orientations from the periphery edge of this stop section, and

have the barrel wall section inserted in the periphery of the aforementioned magnetic coil, and project towards the outside of the direction of a path on the periphery of this barrel wall section, While countering the aforementioned stop section, being arranged and stopping the other end of the aforementioned magnetic coil The technical means equipped with the grand plate fixed to the aforementioned barrel wall section and the tubed starter case which fixes the aforementioned coil housing by pressing two or more aforementioned protruding line sections fit in an inner circle wall was adopted.

[0006]

[Function] According to a claim 1 and invention according to claim 2, pressing a magnetic coil on a grand plate, after inserting a magnetic coil in the inner circumference of the barrel wall section of coil housing, by fixing the grand plate to coil housing, the end section of a magnetic coil is stopped in the stop section of coil housing, and the other end of a magnetic coil is stopped on a grand plate. And the barrel wall section of coil housing is pressed fit in the inner circle wall of two or more protruding line sections prepared in the starter case. Or a magnetic coil is fixed to a starter case by pressing fit in the inner circle wall of a starter case two or more protruding line sections prepared in the barrel wall section of coil housing. In addition, since the barrel wall section of coil housing is pressed fit in the inner circle wall of a starter case, the deformation to the method of the outside of the direction of a path of coil housing is suppressed.

[0007]

[Example] The magnet switch for starters of this invention is explained based on the example shown in drawing 1 or drawing 4 . Drawing 1 or drawing 3 is drawing having shown the 1st example of this invention, and drawing 1 is drawing having shown the starter of an automobile. The starter 1 of an automobile is equipped with the starter motor 2 and the magnet switch 3 for starters. The idle gear 4 is connected with the armature (not shown) of the starter motor 2 through the drive gear (not shown).

[0008] The clutch gear 7 which tells the turning effort of the starter motor 2 to a pinion shaft 6 through a spline shaft 5 is connected with this idle gear 4. Moreover, the pinion shaft 6 has formed in the point the pinion gear 8 which gears to the starter ring (not shown) of an internal combustion engine, and tells the turning effort of the starter motor 2 to this pinion gear 8. And between the inner circumference of a spline shaft 5, and the periphery of a pinion shaft 6, the return spring 9 which returns a pinion shaft 6 to a static position from a move position is arranged.

[0009] The magnet switch 3 for starters has a plunger 10, a magnetic coil 11, the coil housing 12, the grand plate 13, and the pin center,large case 14. A plunger 10 is equipped with a traveling contact 15 and the plunger shaft 16. This plunger shaft 16 is arranged on the same axial center as a pinion gear 8, and possesses the return spring 17 which returns a plunger 10 to a periphery from a move position at a static position. Moreover, the plunger shaft 16 is connected with the pinion shaft 6 through the steel ball 18.

[0010] In addition, a traveling contact 15 contacts the stationary contact 20 connected to the bolt 19 for terminals, when a plunger 10 moves in the direction of a knockout of a pinion gear 8. Through the insulating washer 21, the grand plate 13 is contacted and this stationary contact 20 is being fixed to the pin center,large case 14 through an insulating bush 22 and the insulating, insulating bush 23.

[0011] A magnetic coil 11 is rolled by the pull-in coil rolled by the thick line, and the narrow line, consists of a weak holding coil of magnetomotive force from a pull-in coil, and is wound around the bobbin 24 made of a resin inserted in the periphery of the plunger shaft 16. In addition, a magnetic coil 11 is held in the coil housing 12, and 25 is joined to the peripheral face of the coil housing 12 by welding etc. in the end of a ground side edge.

[0012] The coil housing 12 is a product made from a magnetic material, and as shown also in drawing 2 and drawing 3 , the barrel wall section 26 and the annular stop section 27 are formed of press forming. The barrel wall section 26 is a portion which is extended in the direction which is parallel to the plunger shaft 16, and is pressed fit in the inner circle wall of the pin center,large case 14. The stop section 27 is a portion which is bent at the plunger shaft 16 side from the pinion gear 8 side-edge section of the barrel wall section 26, and stops the end section of a magnetic coil 11 through an elastic member (not shown).

[0013] In addition, the extraction hole 28 for taking out 25 in the ground side edge end of a magnetic coil 11 is formed in a part of stop section 27 of the pinion gear 8 side-edge section of the barrel wall section 26. The grand plate 13 is a product made from a magnetic material, and forms a magnetic circuit with the coil housing 12. This grand plate 13 counters the barrel wall section 26 of the coil housing 12, is arranged, and stops the other end of a magnetic coil 11. Moreover, the grand plate 13 is fixed to the back end section of the barrel wall section 26 of the coil housing 12 by the caulking.

[0014] The pin center,large case 14 is a starter case of this invention, is formed by aluminum die casting and connected between the front housing 29 and the switch cover 30. This pin center,large case 14 is equipped with the retaining wall 33 which supports a spline shaft 5 free [rotation] through bearings 31 and 32 with the front housing 29, the fixed wall 34 which fixes the coil housing 12, and the annular wall 35 formed between the retaining wall 33 and the fixed wall 34.

[0015] In addition, in the inner circumference by the side of the annular wall 35 of the fixed wall 34, as shown in drawing 2, it has the slot 37 formed between the two protruding line sections 36 which carry out proximal to two or more protruding line sections 36 formed in shaft orientations. The barrel wall section 26 of the coil housing 12 is pressed fit in the inner circle wall of two or more protruding line sections 36.

[0016] The fixed method of this MAGUNETCHI coil 11 is explained based on drawing 1 or drawing 3. First, the grand plate 13 is fixed to the back end section of the barrel wall section 26 of the coil housing 12 by the caulking, pressing a magnetic coil 11 from an other end side to the stop section 27 side with the grand plate 13, after inserting the cylinder-like magnetic coil 11 in the inner circumference side of the barrel wall section 26 of the coil housing 12 until the end section contacts the stop section 27. For this reason, receipt maintenance of the magnetic coil 11 is carried out into the coil housing 12. In addition, as for 25, it is good simultaneously to take out from the extraction hole 28 formed in the coil housing 12 to the periphery side of the coil housing 12, and to join to the peripheral face of the coil housing 12 by welding etc. in the ground side edge end of a magnetic coil 11.

[0017] And the barrel wall section 26 of the coil housing 12 is pressed fit in the inner circle wall of two or more protruding line sections 36 formed in the fixed wall 34 of the pin center, large case 14 until the stop section 27 contacts the annular wall 35 of the pin center, large case 14. Since it is mitigated from the thing of the type in which a slot 37 does not have the insertion pressure of the coil housing 12 by two or more protruding line sections 36 and two or more slots 37 at this time, the outer-diameter tolerance of the coil housing 12 formed by braces fabrication can set up greatly. Thus, the coil housing 12 is held at the pin center, large case 14 by inserting the barrel wall section 26 of the coil housing 12 in the inner circumference of two or more protruding line sections 36 of the pin center, large case 14.

[0018] Since it is regulated by two or more protruding line sections 36 by which the barrel wall section 26 of the coil housing 12 was formed in the fixed wall 34 of the pin center, large case 14 in the deformation to the method of the outside of the direction of a path at this time, the deformation to the method of the outside of the direction of a path of the barrel wall section 26 of the coil housing 12 is suppressed. Consequently, a magnetic coil 11 is always fixable to a position. Moreover, since the simple work of only pressing fit can perform attachment by the coil housing 12 and the pin center, large case 14, it attaches, and a man day can be decreased.

[0019] Drawing 4 is drawing having shown the 2nd example of this invention, and is drawing having shown the principal part of the magnet switch for starters. In this example, the protruding line section 36 and a slot 37 are abolished from the inner circumference of the fixed wall 34 of the pin center, large case 14, the protruding line section 38 and a slot 39 are formed in the periphery of the barrel wall section 26 of the coil housing 12, and the barrel wall section 26 of the coil housing 12 is pressed fit in the fixed wall 34 of the pin center, large case 14. It has the effect as the 1st example also with this same example.

[0020]

[Effect of the Invention] A claim 1 and invention according to claim 2 are fixing the inner circle wall of two or more protruding line sections of a starter case, and the barrel wall section of coil housing by pressing fit. Or the inner circle wall of a starter case and two or more protruding line sections prepared in the barrel wall section of coil housing are fixed by pressing fit. By it, since at least one caulking process can decrease, attachment work can be simplified. And since the deformation to the method of the outside of the direction of a path of this coil housing can be suppressed when coil housing is fixed to a starter case, a magnetic coil is certainly fixable.

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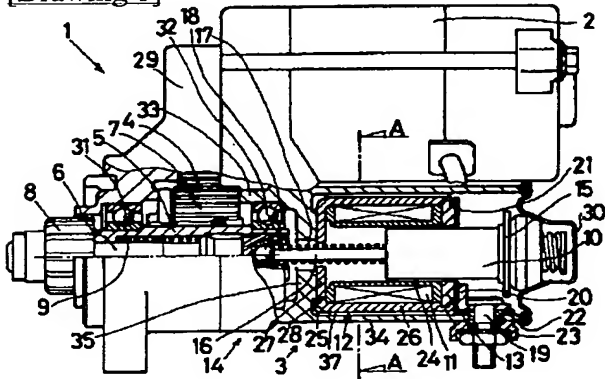
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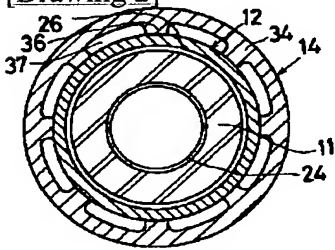
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DRAWINGS

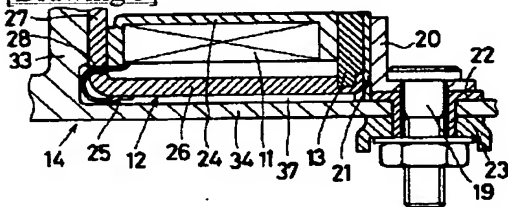
[Drawing 1]



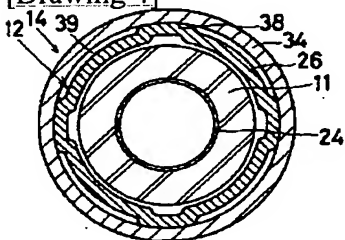
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Translation done.]